

LOCAL MARINE RESOURCE MANAGEMENT:

The Role of Fijian Villagers in Co-Managing a Small-Scale Fishery

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Abstract This case study presents findings from Gau Island, Fiji, on a local initiative to reinforce community-based management and make it more applicable to contemporary challenges. Local communities are becoming increasingly involved in coastal marine resource management, yet little remains known about the local foundations for long-term success of this involvement or about how resilience of fishing grounds to conservation and user needs can be achieved. Sociological methods were employed to investigate (co-)management measures recently put in place, key stakeholders' roles in addressing these, and their perceptions of them. Findings from the research show that the choice of measures and responsibility for their implementation still rest with a few key individuals only. Perceptions of the communities under study of the implemented management measures were generally positive. However, more information for decision-making and continuous support for empowering the communities in terms of ecological understanding and enforcement of measures are required for strengthening the present local management regime.

Introduction

Small-scale fisheries are important worldwide for providing food, income and livelihood, especially in developing countries; worldwide, they support the livelihoods of more than 200 million people (McGoodwin 2001). Yet, they have often been ignored and marginalised and very few have been well managed (for example, McGoodwin 1990, 2001; UNESCO 2001; Chuengpagdee and Pauly 2004). A bottom-up approach to resource governance that brings local users into the management process has been adapted by governments worldwide (Jentoft and McCay 1995; McGoodwin 2001; Borrini-Feyerabend *et al.* 2004; Jentoft 2005; King

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2005). This includes various ways in which local communities can become more involved, for example in participatory, community-based marine resource management (CBMRM) or co-management (Ruddle and Akimichi 1984; Ruddle and Johannes 1985; McGoodwin 1990; Hanna 1992; Dyer and McGoodwin 1994; King *et al.* 1995; Dubbink and van Vliet 1996; McColl and Stevens 1997; Pomeroy and Berkes 1997; Jentoft *et al.* 1998; Russ and Alcala 1999; Agrawal and Gibson 2001; Johannes 2002; Pauly *et al.* 2002; Cinner and Pollnac 2004). Different perspectives and definitions of co-management approaches exist; these include who is sharing management responsibilities, how much authority is delegated (whether stakeholders have voting and decision power or only a consultative role), how effective the management system is, and how high the compliance with the rules is (for example, Hall 1972; Pinkerton 1994; Sen and Raakjaer Nielsen 1996; Lane and Stephenson 1997; Borrini-Feyerabend *et al.* 2004).

The necessity of bringing local users and stakeholders into the management process has thus been widely acknowledged as a more 'humanised' process of fisheries management (for example, McGoodwin 1990; Jentoft and McCay 1995). This has often proven problematic in fiscal and regulatory senses, for example in countries where the population is spread over islands several hundred kilometres apart. Such devolution offers potential benefits to governments and local communities in terms of greater scope for sustainability, efficiency and equity of resource use (for example, McGoodwin 1990; Bailey and Zerner 1992; Dyer and McGoodwin 1994; Steins 1999; Bavinck 2001; Johannes 2002; Adrianto *et al.* 2005), but it is still unclear whether these can be achieved in practice. One constraint is the lack of effective information exchange between the authorities, including the uptake of the relevant knowledge and perceptions (McGoodwin 1990; Stoffle *et al.* 1994; Cooke and Moce 1995; World Bank 2000). Beyond this, several questions remain. Who has the power to decide on and implement management measures? Who do communities think has the knowledge and position to do this? Who is in fact actively engaged in it? Rigorous assessment of the answers in each specific local setting is needed to uncover conditions of long-term success and develop a working management regime, including livelihood security, resource conservation and sustainability.

Among and within the countries and territories of the tropical west and central Pacific Ocean, considerable ecological, cultural, social and political variation exists (Dahl 1980; Kolig and Mückler 2002; Novaczek *et al.* 2005). This variation coexists with the common history that peoples throughout Oceania share: colonial authorities came, stayed often more than a century and established new types of leaders and power centres competing with the islands' traditional systems (Watson-Gegeo and

Feinberg 1996). After independence (1970-80s), and under the increased decentralisation efforts of many island nations in Oceania within this political (dis)order, the reliance on communal and village levels of governance gained new focus. In Fiji, as in many British colonies, the state implemented a dual administrative structure, with regulations and institutions pertaining to indigenous Fijians (such as the Great Council of Chiefs) and those for the general population (Westminster parliamentary system; Ruddle 1995; Leckie 2002). As in other Pacific island states, Fiji's rural regions have a subsistence economy and rely heavily on marine resources for food and income (MacKay 2001; Novaczek *et al.* 2005); fisheries are one of the country's major industries, in addition to sugar cane, tourism, gold mining, and forestry.

Responsibility for fisheries resources matters lies with the Fisheries Division under the Ministry of Agriculture, Fisheries and Forests. Fishing activities in Fijian inshore waters are regulated by the Fisheries Act (Government of Fiji 1985), and village and provincial administrations are supposed to meet regularly and work together in all aspects of fisheries management. The country retains a customary marine tenure (CMT) system, built on local autonomy and self-reliance; its potential function is to control the invasion of local marine space, use by residents, and the use of specific resources and fishing gears (South and Veitayaki 1998). The CMT system divides the inshore fishing grounds into 410 registered customary fishing rights areas (*qoliqoli*), ranging in area from one to 5,000 km² (Cooke 1994; Zann and Vuki 1998). These areas provide the majority of the catch for subsistence fishers, dominating Fiji's coastal fisheries, and are thus the source of a significant portion of the sustenance of the people. The *qoliqoli* are an integral part of a tribal land-sea 'estate' (*vanua*) or district (*tikina*) that extends from the watershed seawards, generally to the outer margin of the seaward slope of the fringing reef. The chief of a *vanua* is traditionally regarded as the owner or supreme guardian of its land, waters, resources and resident indigenous people; this kind of kin group tenure system can also be found elsewhere in the Pacific (for example, Sudo 1984; Davis 1984; Kolig and Mückler 2002; Novaczek *et al.* 2005). Since colonial times, the *qoliqoli* have been subject to a form of dual ownership, where the waters and all resources within these belong to the traditional owners, but the seafloor is owned by the state. This arrangement is reflected in the Fiji Fisheries Act and, in theory, establishes a connection between indigenous owners and central and provincial government for management purposes. For example, in order to issue a fishing licence to an outsider, the Fisheries Division needs the written authorisation of the respective indigenous *qoliqoli* owner. Many coastal resources could thus be managed cooperatively; yet, although fishing is not only a main food source for most rural villagers but also a

ubiquitous way of life, the local foundations for such co-management (for example, distribution of responsibility) have received little critical attention so far (for example, Thompson *et al.* 1983; Cordell 1984; Cooke 1994; McGoodwin 2001; Novaczek *et al.* 2005).

Although pressures on fishing grounds decline with increasing distance from urban centres, resource owners all over Fiji have acknowledged the depletion of certain marine resources (Jennings and Polunin 1996; Naqasima-Sobey and Vuki 2000; IAS 2002; Johannes 2002), attributed to intensive exploitation for subsistence and commercial demands. Besides bleaching, overexploitation now ranks amongst the highest threats to Fijian coral reefs and inshore areas (World Bank 2000; Sulu *et al.* 2002). To address the trend of over-exploitation, some Fijian communities have developed their own CBMRM approach over the past five to ten years. A diversity of factors and issues has influenced the measures taken by different communities, and these measures thus vary greatly in extent and character across Fiji (Dalzell *et al.* 1996; Cooke *et al.* 2000). Unlike the situation in more regulated countries of the western Pacific (for example Japan, Akimichi and Ruddle 1984), different levels of government- and community-involvement are present, and the focus has been on a few locations where initial contact was uncomplicated. Apart from the Fisheries Division, some communities were able to establish closer bonds with local Non-Governmental-Organisations (NGOs) (for example, Worldwide Fund for Nature [WWF]) and other official institutions; these include the University of the South Pacific (USP) in Suva with its School of Marine Studies (SMS) and Institute of Applied Sciences (IAS), used to facilitate management activities. In order to join forces and reach some level of unity, some of these institutions have come together in 2002 under the umbrella of the Fiji Locally Managed Marine Areas (FLMMA) network. For such complex, de-centralised, multi-stakeholder management systems to work, the perceptions held by involved stakeholders on planned and implemented management measures will be important (for example, Vunisea 2000) but have not been researched and made available yet for Fiji. The objectives of this study therefore were to investigate in an island setting:

- the management measures that are in place today;
- who participated in the making of decisions related to these measures and their implementation, and
- how the local people addressed and perceived these measures and the directly related issues concerning their marine environment and their own everyday lives.

In this way, this paper seeks to understand the role of social interaction and information exchange between official agents and local communities for long-term success of local marine resource management measures.

This case study was conducted in 2004 in *Tikina* Vanuaso on the Island of Gau, a small undeveloped island in the Lomaiviti island group in the Eastern Division of the Republic of Fiji (Fig.1), roughly seventy km east of Suva (18 00'S, 179 20'E). At the time, community workshops on conservation issues (for example, mangrove rehabilitation, waste management) and initial management plans concerning the island (initiated by USP, IAS and WWF) offered scope for relevant information and perceptions. In *Tikina* Vanuaso, the workshops were led by Dr. Joeli Veitayaki (USP), now the Head of School at SMS and (at that time) the only indigenous Fijian lecturer in Marine Sciences; Dr. Veitayaki was also born and raised in this *tikina*. The Lomaiviti group of islands, to which Gau belongs, forms the eastern centre of the Fijian islands. Spread over an area of more than 12,000 km², the islands of the Koro Sea represent an important part of the Fijian reef system; however, they have received little attention in the literature.



Figure 1. Overview of Fiji and the Location of Vanuaso Tikina on Gau Island (18°00'S, 179°20'E).

Methods

The information for this study was derived from four coastal communities (namely Malawai, Vanuaso, Naovuka, Lamiti) belonging to *Tikina* Vanuaso, located on the eastern part of Gau island and sharing the same *qoliqoli*. The size of the four villages studied varied from 100 (the smallest being Naovuka) to around 200 inhabitants (Vanuaso). The number of fishers in each of the villages varied between more than twenty (Naovuka) to more than fifty (Lamiti), while each family is involved in fishing, mainly for subsistence, without age or gender restrictions. Main sources of income are the selling of crops, animals, or woven mats or cash transfers from relatives living in urban areas. An evaluation of community intervention into fisheries management was started in 2003, together with ideas for the development of local management plans for each village and the entire *tikina*.

A mixed-method approach was employed, using methods derived from the social sciences: semi-structured face-to-face interviews, focus groups as well as participant and non-participant observation (for example, Bryman 2001; Costa Neto and Marques 2000; McClanahan *et al.* 2005; McGoodwin 2001). To investigate the management measures in place and the perceptions on the present situation, three individual semi-structured interviews (open to various personal answers, with almost no Yes/No questions) were conducted in each of the four villages respectively (twelve interviewees in total). The first interview was conducted with one of the main persons responsible for the management and protection of the fishing ground adjacent to the village and the villagers' fishing activities within. The main interviewees were in this case four men between thirty-five and fifty years of age. These individuals not only had responsibilities towards the management of the *qoliqoli* but also served as councillors and spokespersons for the chief and people of the respective community (or even the entire *tikina*), and were therefore much respected: Josese Rogo (Malawai), Nacanvieli Ravula (Naovuka), Timoci Serevi (Lamiti), Viliame Nasave (Vanuaso). Questions included the topics of decision-making and information transfer, fishing licences, closed areas, other restrictions and illegal activities, and fishwardens. The other two interviews were done with two fishers (one female, one male per village), where information was sought on their perceptions of change in the *qoliqoli*, including its fish and invertebrates, the reef and its uses. The interviews did not make a specific target of traditional ecological knowledge of the resources and their management.

The information derived from four focus group meetings complemented that from the individual semi-structured interviews. In each community, a focus group meeting was conducted with four

fisherwomen (sixteen interviewees in total), using an interview guide on subjects concerning the fishing ground and its resources. These group interviews were a useful method to learn about social interaction, as well as perceptions. Women were chosen for the focus groups as they formed the main fishing group in *Tikina* Vanuaso, in terms of amount time spent and amount of animals caught.

Participant and non-participant observation was used as an overt strategy (Bryman 2001) to gauge information complementing that generated by the interviews and focus groups. Information thus sought encompassed fishing activities, meetings and responsibility distribution, in order to detect community's perceptions on the management measures. This included informal talks and following the actors (Steins 1999) in their everyday activities. The notes from the observations were categorised and used for complementary information wherever possible and useful. The individual semi-structured interviews took place in the houses of the respective interviewees; focus groups were held in the house of one of the interviewed women. The interviews were recorded at the time in a notebook, often preferred to the use of a tape recorder. The questions used for all interviews had been translated into Fijian, while a local translator was present during all interviews. All direct statements quoted in the following were made by the interviewees, and are thus specific to *Tikina* Vanuaso. The data presented here forms part of a larger data set collected during nine visits to Gau over the course of one year.

Results

Decision-making

Decisions affecting the *qoliqoli* were usually made – like all decision concerning the village and the *tikina* – in regular village meetings headed by the chief of the village, as well as in *tikina* meetings (*bosi ni tikina*) headed by all chiefs of the *tikina* and their spokespersons.

In this study, information flow took another route by including a relative in a powerful position who could then give advice, suggest a solution and help with its implementation.

Five years ago, no management measures were yet in place on Gau and fishers, especially the women, had noticed declining catches, smaller fish sizes and deteriorating quality of their fishing grounds; they asked Dr Veitayaki what they could do. Village and *tikina* meetings and a management workshop followed with initially only one village discussing potential management measures suggested by the University group. The first initiative was the establishment of fully closed areas (*tabu* areas, see below), into which the other villages joined in one by one over the next

two years. One fisherwoman said that before the people from USP came and told them what could be done, no restrictions were followed: ‘before, we did not know what to do.’ Other meetings followed, during which the location and size of the closures were discussed and decided. Everybody could attend these village and *tikina* meetings, men and women, young and old. In this way, all villagers could contribute to and discuss decisions; the final decision, however, lay with the chiefs of the villages and the chief of the *tikina*. Women could thus be involved in decision making and ‘can contribute by their own will, when urgent issues arise’, but ‘not often do they make use of it’.

Information needs

The information on which the decision to act was made thus came from the fisherwomen of the villages. Dr Veitayaki collected the issues of concern and transferred them to the *tikina* spokesperson, *mataqali* (clan) leader and chiefs of the *tikina*. The information on possible management measures and ways of implementation then came from the University group (Table 1). Village and *tikina* meetings generally were the main tool of information gathering and exchange at the island level; from there, all information was distributed to the communities. These meetings were held regularly (once or twice a month), to discuss general issues ‘concerning the welfare of the village and the *qoliqoli*’. Additional meetings were held whenever the need arose. Discussions (usually amongst men) also took place in the usual social gatherings on everyday evenings in the community halls around the *kava* bowl.

Table 1. *Roles of Community, University and Government Divisions in Addressing Conservation and Management Issues (USP=University of the South Pacific).*

Action	Role
Initiation	Community (Fisherwomen)
Assessment of situation	USP
Suggestion of first measures	USP
Discussion and agreement	Community
Implementation + Information	USP
Information distribution	Community
Fishwarden	
Information	USP
Discussion + selection	Community
Training	USP + Fisheries Division

In addition, provincial meetings took place ‘sometimes, but not regularly’, and were the main place for information exchange at the inter-island level and with government officials (for example, from the Fisheries Division). Other than that, if government officials from Suva or Levuka, the provincial capital, came to Gau they only came to the whole *tikina*, ‘never to the villages themselves’. ‘They come maybe two or three times a year, and then normally stay one day.’ All twenty-eight interviewees said they still needed more detailed information in order to make decisions (Table 2). ‘Yes, more information is needed, from Fisheries and USP for fishing, land management, et cetera.’ Another said, ‘they should make information easier to understand, if pamphlets and video equipment would be brought, that would be good’.

Table 2. *Inshore marine resource management measures in place in Vanuaso tikina today (CL=Customary Law, FA=Fisheries Act).*

Management Measure	Legal origin	Community Perception
Participatory decision-making	CL	+ OK - More information needed
<i>Qoliqoli</i> rights limited to residents	CL; FA	+ Present situation OK + No licences for outsiders - Poaching still occurs
<i>Tabu</i> areas (full closure since may 2001, temporary)	CL; (USP)	+ OK and respected, many benefits - Varying perceptions on location, size and time of closure
<i>Tabu</i> on spawning or endangered species	FA; CL	- Lack of understanding by some - Differences between communities
Gear restrictions (for example, no scuba equipment, meshsize > 2.5 inch)	FA	+ OK, generally respected - Lack of understanding by some - Differences between communities
Size restrictions	FA	+ OK - Lack of understanding by some
Ban on destructive methods (for example, <i>duva</i> , <i>vutuguru</i>)	FA; (CL)	+ OK, generally respected
Fishwarden (two per village since 2003)	FA	+ Positive changes, patrolling level sufficient - Boats for enforcement, salary, more regular meetings and education needed

Fishing licences

At the time, no outsider (non-resident of the *tikina*) held an access permit (fishing licence) to fish in the inshore waters of *Tikina* Vanuaso; only local villagers are allowed. There were, however, locals who fished commercially in these areas without any licences. In one village, the last licence was given four years ago to two men of a neighbouring village; in another village, no permit has been issued to an outsider since 1991.

Contrary to the arrangement formulated in the Fisheries Act for licensing requests, the chiefs of this *tikina* usually did not talk to the Commissioner of the Division in which this *tikina* was located. 'Suva does not have to be informed; the chief of the *tikina* can tell the Fisheries Department about the licence, but it is not necessary.' Independent from any gifts, for example a precious *tabua* (whale tooth), the chief had to first ask the *mataqali* and *yavusa* (family group) concerned before issuing any licences; and if an agreement was reached, the outside fisherman had to learn the local rules and restrictions. 'But at the moment we would not give a licence out, because of the many *tabu* areas.'

Tabu areas and other restrictions

All of the villages in this *tikina* had one *tabu* area – a fully closed no-take area, extending from the shoreline to the outer reef slope (Fig.2), as the first and main initiative for inshore marine resource conservation. 'In the 1960 and 1970s there was still plenty of fish, but that has decreased since then. In 2001 Joeli [Veitayaki] came and informed us about the benefits [of a *tabu* area].' The first *tabu* area was established in May 2001; the other villages followed over the next 1.5 years ('after we saw it was a good idea'). With help from USP and the Fisheries Division, buoys were provided to mark the *tabu* area boundaries.

The locations and size of the *tabu* areas were decided after discussions during village meetings (consensus-driven decisions) (Table 1), based on the following criteria: easy accessibility and presence in front of the village for surveillance; areas where coral needed to grow back; or where grandfathers and elders said the area was good before. The locations also had to be discussed amongst the villages, as parts of the *qoliqoli* were shared by the adjacent villages and problems arose where people felt they were left out of the discussion 'and all of a sudden, that area is closed'. With one *tabu* area per village, more than a third of the *qoliqoli* was now closed for access and any kind of fishing activities. The closure of all *tabu* areas in this *tikina* was planned to be in effect for five years; what was to happen after this period still needed to be discussed. The interviewees started to see differences between the state of the closed and open-access areas of the *qoliqoli*, but different perceptions persisted (Table 2). Some interviewees said that with the presence of the *tabu* area,

they now spend less time on fishing than before the closure, when they had to go fishing for the whole day to catch enough. While for these community members the *tabu* areas seemed to become a marine ‘wonderland’ (‘there is plenty, plenty fish and healthy coral’; ‘the longer it will be closed, the better’), others did not see the direct benefits. The women especially wanted the existing *tabu* to be reopened or at least moved to another place of the *qoliqoli*, mainly because they thought they closed off fishing space in proximity to the villages, thereby making fishing more difficult as fishers had to venture greater distances. Generally, however, most interviewees claimed to be happy with their *qoliqoli* and said it provided enough food for them now.

Other than these no-take areas, some general restrictions on fishing activities, regulated by the Fisheries Act, existed for every village and for all inshore areas. These restrictions included: access by outside fishers; the use of *duva* (the root of the derris plant, *Derris trifoliata*, used as fish poison); the use of nets with mesh sizes smaller than 2.5 inches; the catching of fish and crabs smaller than three inches; laying anchor on coral; the practice of *vutuguru* (to ‘fish’ by beating and destroying coral with sticks while netting around the coral colony); catching turtles; and the use of dynamite (Table 2). While not all of these restrictions were entirely understood and/or adhered to on village level, none of the destructive methods were observed to be used during the time of this study.



Figure 2. View from Vanuaso Tikina, Gau Island, on *Qoliqoli* with Fringing Reef in the Background and *Tabu* Area in Front of Lamiti in the Foreground. [Photo: A. Lanting]

Poaching

All twenty-eight interviewees stated that poaching occurred in their fishing grounds. They said the poachers did not come very often - only once every two or three months; the frequency depended on good weather and calm seas. One interviewee added: 'I saw one from this village, last month, at night inside the *tabu* area. A meeting followed and he admitted, and the chief said not to do that again otherwise he will be reported to the police. This is very strict now.' The poachers were said to be mainly fishermen from Suva, coming with small fibreglass boats, but were also sometimes people from other villages in the *tikina* and on Gau. One of the interviewees said he knew where they kept their boats in Suva, so when he was in town, he looked at the boats, and knew who they were and could report them. These intruders were said to only come at night and go especially to the *tabu* area. The methods used were mostly spearguns with underwater torches (both equipment difficult to afford for the villagers), but sometimes also normal (wooden) spears, fishing nets and lines.

In the event a poacher was seen by a community member, he or she could report the intruder either via the traditional way to the village chief and *turaga ni koro* (village headman), or, if existing, to the local fishwarden, who then reported to the local police officer. If possible, the fishing licence and gear were checked and, if not in accordance with regulations, the poacher(s) were handed over to the local police post and their gear confiscated.

Fishwardens

All the villages in *Tikina* Vanuaso had for the first time, between August and October 2003, used their right to appoint two honorary fishwardens. The four interviewees responsible for *qoliqoli* matters were one of those assigned in their village. Their duties were to report any illegal activities observed in the *qoliqoli*, the prime goal being to look after the *tabu* area. They had to look at the size of fish caught and the type of fishing method used, and report to the Fisheries Division monthly in written form. Patrolling took place around twice a week, when the wardens went out fishing themselves, 'whenever they can' and additionally 'when need arises'. In addition, the fishwardens were expected (as were the other community members) to look everyday from the shore to check, for example, whether somebody was seen around the *tabu* area. Although there were plans by USP, NGOs and the Fisheries Division to provide boats to these fishwardens for better implementation of their duties, none of the villages at that time had one exclusively for this task. Instead one of the few privately owned fibreglass boats in the village had to be taken and the fuel for the action paid by the community and the owner of the boat.

In the same way, the Fisheries Division had planned salaries for the fishwardens' work and time, but so far, all of them were still volunteering. The interviewed fishwardens of *Tikina* Vanuaso thought the present level of patrolling and personnel was sufficient and considered the perceived changes as satisfactory for the intended purpose (Table 2): 'the level is enough right now, there are not too many outsiders'. All interviewees agreed, however, that boats were needed to catch the poachers. And 'if there are plenty of people coming at night, and two fishwardens are not enough ... then we might ask the chief to appoint more men, to be safer'.

The fishwardens in this *tikina* were all appointed during village and *tikina* meetings (Table 1), based on several criteria: being experienced fishermen; having a lot of experience and interest in protecting the *qoliqoli*; knowing the ocean; living on the coast for most of their lives; being strong, good and tough men respecting the rules of the *vanua*; understanding what is taught by the Fisheries Division (at least secondary level English); but also for more geographic-logistical reasons such as owning land that is large and overlooks at least part of the *qoliqoli*. The appointed men completed a training course conducted by the Fisheries Division in Suva (Table 2), after which they each received a licence for identification and enforcement of regulations while patrolling.

The first official fishwarden meeting was held in November 2003, with the police officer of the *tikina* invited as well. The report of this meeting was sent to the Fisheries Division in Suva and Levuka, and copies given to the two implementing agencies (IAS and SMS) at USP. Regular follow-up meetings for all fishwardens were supposed to be held every three months, in different villages in succession, and every six months a Fisheries official was to be invited. This regularity, however, was difficult to adhere to and after six months no second meeting had taken place yet – 'the program is still in an early stage in fact finding and problem reporting'. Many things needed time and a lot of 'coconut wire'(passing on the words by hearsay); now that both fishers and fishwardens said the *tabu* areas were good, and that fish size and abundance increased, other community members started believing in their usefulness and supported this measure.

Discussion

There has been important movement over the past years in the way the *qoliqoli* of *Tikina* Vanuaso is used and managed by its communities. One difficulty for CBMRM on Gau seems to be the individuality of each community, which is why it remains important to investigate people's perceptions in order to develop an adaptive feedback mechanism for

learning and understanding. Such mechanisms are essential to a sensitive co-management approach (Taiepa *et al.* 1997; Johnson 1999; Mathiesen 2003; Olsson *et al.* 2004). Although as a whole the process is consensus-driven, the perceptions and opinions within each community, as well as driving the behaviour of individuals or groups, varied greatly. For example, despite their valuable experience the women are not (yet?) an integrated part of the information-transfer and decision-making progress in this *tikina*, as they did not feel any responsibility. The same is true for many decision-making processes related to coastal marine resources in communities of other South Pacific island countries (Novaczek *et al.* 2005).

Individual perceptions influence other management issues also, including fishing licences, the numbers of which are increasingly restricted across rural Fiji (Fong 1994; Veitayaki 1998). This trend was reflected in the findings of this study. Especially in remote areas such as Gau, where natural resources are still more valuable for survival than money, awareness of resource scarcity and of the need to look after the interests of their own people has been growing (Veitayaki 1998). Thus, in the future of the *qoliqoli* this awareness, and as a result the number of licences issued, will depend greatly on the character and education of the respective fishing rights owners.

In the recently established *tabu* areas, restrictions on gear use, size and type of species caught work for the moment, but contain flaws. One has to be very careful when idealising these areas, which builds up high expectations. Nonetheless, they can be seen as successful in that they have helped to raise awareness amongst villagers, and to keep outsider numbers down. They also play an important role in the decentralisation movement and establishment of local management authority (for example, Russ and Alcalá 1999; Borrini-Feyerabend 2001; Geoghegan and Renard 2002; White *et al.* 2002) as they have provided the first opportunity for the communities and an outside agency (USP and Fisheries Division) to work together in local marine resource management and conservation. The honorary fishwardens, selected by the community but trained by USP and the Fisheries Division, are also an important move towards co-management, despite their powers being restricted by lack of boats and information; a common situation in tropical coastal fisheries (for example, Stoffle *et al.* 1994; Shepherd *et al.* 2004).

In terms of the management measures – partly anchored in the present Fisheries Act of the Government, partly adapted from local Fijian customary laws – introduced to stop the perceived decline of marine resources, it seems as if government and communities coincide in supporting the same goals and measures, and complement each other in their implementation. Continuity and enforcement of the management

measures are, however, entirely up to the communities themselves. Some people would think of this enthusiastically as embodying true independence, traditionally anchored and functioning in other parts of the western Pacific (for example, Sudo 1984; Akimichi and Ruddle 1984). The line between independence and being left alone, however, depends on knowledge, the transfer of which is almost non-existent between many rural communities and government in Fiji. Ultimately, political relations between communities and national institutions must be adopted through government structures, legislation, and policy if continuity and sustainability of CBMRM measures are to be ensured (Akimichi and Ruddle 1984; McGoodwin 1990; Feldmann 1994; Wright 1994; Hunt 1997; Courtney *et al.* 2002). A privileged connection to official institutions or individuals has been found earlier to be positively related to a higher degree of management and awareness, and this is not limited only to Fiji (for example, Cooke *et al.* 2000; McGoodwin 2001; unescap 2000). Knowledge in the communities for decision-making and information transfer was in this case awarded to and accumulated within a few individuals per village only, who ideally are respected and listened to by the other villagers. But as the political, social and natural environments change, knowledge has to change. For this to occur, information transfer and education have to improve. This process is very slow but seen as desirable by at least the communities in this study, who wish to be able to correctly manage their *qoliqoli* under today's circumstances. This statement comes from people who through generations of skilled and experienced ancestors had a thorough knowledge of their environment, but who do not feel in the position today to make informed decisions. Colonisation of a country and a long history of development projects (Veitayaki 2000; Kolig and Mückler 2002; Mühlig-Hofmann *et al.* 2004; Novaczek *et al.* 2005) cannot be made accountable for its more recent problems, but a certain passiveness amongst rural Fijian islanders cannot be denied (Lal 1992; Tomlinson 2004). This includes a loss of 'feeling' for the environment, stemming from more than a hundred years of a foreign ruling body bringing a new structure and Western focus into the country and people's minds. In addition, even though inter-generational exchange of resource knowledge may still exist in some communities, this knowledge has not yet been recorded systematically, in order to learn from the experience of the older generation and integrate it into present CBMRM efforts in Fiji. Such a lack of documentation is also known from other developing countries (Ram-Bidesi and Mitchell 2005; Malunga 2006) and may pose considerable challenges to community-based efforts; with increasing external pressures and influences, less and less knowledge is transferred through this oral process.

Without the connection to USP, therefore, not much might have happened on Gau, and conservation activities might not have been driven forward. Although this paper is only a case study, the need for communication with a group or individuals who can advise is likely to be the same for other rural communities in Fiji and elsewhere (for example, Foale 1998; McGoodwin 2001). To realize continuity and personal involvement nationwide in Fiji, every community or *tikina*, with the support of the Fisheries Division, could become organised to have at least one experienced (and respected) fisheries manager living in the community; this manager would work continuously with community members and the official agents involved in the management process. Under a system of extension workers similar to that established for teachers and nurses, such 'marine advisors' could be used to familiarise themselves with the communities to the necessary depth. Thus they could play an important role in monitoring and reporting projects, making marine conservation and education matters of everyday life and interest for the communities; in this way, they would support long-term thinking and understanding its importance. This system ideally could further increase community participation and support national efforts towards co-management.

The strength of co-management regimes can be evaluated by the extent of power transfer, the level of community participation, and equally the community's capacity to exercise its authority and responsibilities (Berkes *et al.* 1991; Pinkerton 1994; McGoodwin 1990, 2001). Therefore, to get back to the question of responsibility for action in this case study, in theory, and leaving aside economical constraints, by village and government law, everybody in the community could participate in and contribute to discussions and thus influence the decision-making process. When it comes to the question of who people think is supposed to act, however, the government gives freedom to the communities and hopes that they will be able to manage their situation by themselves. Conversely, a cautious attitude of expectation could be found towards action from the government, other official agents such as USP or FLMMA, and 'business people from Suva'. Those who are active, that is those who are moving things in local marine management in this case, are but a few engaged people at both village and government levels, acting in a very project-specific way. Thus, although community participation has increased in Fiji over the last decade, the basis for a strong national co-management regime does not yet exist.

Conclusion

The presented 'fact-finding and problem-fixing' state of local marine resource management in Fiji carries hope but is still very fragile in terms of conservation, with activities depending on the communities involved, and with the potential to fail as soon as changes in the personal ambition and/or composition of an implementing management team or community take place.

To stabilise such a fragile situation, and to achieve system resilience (that is, long-term success for the environment and its people), including a fisheries governance system that communities will support and respond to, the following fact must be made clear: a few people in the necessary positions and with the necessary skills can make a big difference. The environmental knowledge that exists within rural communities must be collected, organised and complemented by modern education adapted to the specific local setting. Thus, the management has to be more adaptive and based on social interaction; eventually, this management needs to develop into a nationwide cooperation with simple guidelines, under village initiative but with the possibility of continuous backup, control, enforcement and advice by governmental and nongovernmental agents.

This is an ideal image which unfortunately is still far from being realised in Fiji as a nation, but is already possible for individual *tikina* and islands. The people's role in the success of CBMRM needs to be better addressed if the commitment to resources management is to be for the long term. To remove the chaos of poor communication and co-ordination of the many individual projects being organised by different agents, Fiji will have to focus and organise its forces on all governance levels, including (environmental) education in rural communities. Only then will the country be able to implement sustainable management, where communities have the power and knowledge (and trust in these) to practice wise management and thus maintain its natural marine resources in the long term.

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